

12/21/01

JC10 Rec'd PCT/PTO 21 DEC 2001

PTO-1390 (Modified)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				077680-0116	
				U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5) Unassigned 10/018789	
INTERNATIONAL APPLICATION NO. PCT/DE00/02037		INTERNATIONAL FILING DATE 06/29/2000		PRIORITY DATE CLAIMED 06/29/1999	
TITLE OF INVENTION DEVICE FOR TREATING EXHAUST GAS					
APPLICANT(S) FOR DO/EO/US Alfred Ernst BUCK					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.					
2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.					
3. <input type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).					
4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19 th month from the earliest claimed priority date.					
5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). <input type="checkbox"/> has been transmitted by the International Bureau. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US)					
6. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).					
7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). <input type="checkbox"/> have been transmitted by the International Bureau. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. <input checked="" type="checkbox"/> have not been made and will not be made.					
8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).					
9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).					
10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).					
11. <input checked="" type="checkbox"/> Applicant claims small entity status under 37 CFR 1.27.					
Items 12. to 17. below concern other document(s) or information included:					
12. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.					
13. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.					
14. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.					
15. <input type="checkbox"/> A substitute specification.					
16. <input type="checkbox"/> A change of power of attorney and/or address letter.					
17. <input type="checkbox"/> Other items or information:					

U.S. APPLICATION NO. (if known) see 37 CFR 1.507 Unassigned 10/018789		INTERNATIONAL APPLICATION NO. PCT/DE00/02037		ATTORNEY'S DOCKET NUMBER 077680-0116	
18. <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS	
Basic National Fee (37 CFR 1.492(a)(1)-(5): Search Report has been prepared by the EPO or JPO.....\$890.00					
International preliminary examination fee paid to USPTO (37 CFR 1.482).....\$710.00					
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))\$740.00					
Neither international preliminary examination fee (37 CFR 1.482) nor International search fee (37 CFR 1.445(a)(2)) paid to USPTO \$1,040.00					
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)\$100.00					
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$890.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than 20 Months from the earliest claimed priority date (37 CFR 1.492(e))					
Claims	Number Filed	Included in Basic Fee	Extra Claims	Rate	
Total Claims	19	- 20	= 0	\$18.00	
Independent Claims	1	- 3	= 0	\$84.00	
Multiple dependent claim(s) (if applicable)				\$280.00	
TOTAL OF ABOVE CALCULATIONS =				\$890.00	
Reduction by 1/2 for filing by small entity, if applicable.				\$445.00	
SUBTOTAL =				\$445.00	
Processing fee of \$130.00 for furnishing English translation later the 20 months from the earliest claimed priority date (37 CFR 1.492(f)).				+	
TOTAL NATIONAL FEE =				\$445.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$0.00	
TOTAL FEES ENCLOSED =				\$445.00	
				Amount to be:	
				refunded \$	
				charged \$	
<p>a. <input checked="" type="checkbox"/> A check in the amount of \$445.00 to cover the above fees is enclosed.</p> <p>b. <input type="checkbox"/> Please charge my Deposit Account No. <u>19-0741</u> in the amount of \$0.00 to the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>19-0741</u>. A duplicate copy of this sheet is enclosed.</p>					
<p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p>					
<p>SEND ALL CORRESPONDENCE TO:</p> <p>Foley & Lardner Washington Harbour 3000 K Street, N.W., Suite 500 Washington, D.C. 20007-5143</p>					
				<p style="text-align: center;">SIGNATURE <u><i>Richard L. Schwaab</i></u></p> <p style="text-align: center;">NAME / <u>RICHARD L. SCHWAAB</u></p>	
REGISTRATION NUMBER 25,479					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 077680-0116

In re patent application of

Alfred Ernst BUCK

Serial No.: Unassigned

Filed: December 21, 2001

For: DEVICE FOR TREATING EXHAUST GAS

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination of the above-identified application, Applicant respectfully requests that the following amendments be entered into the application:

IN THE CLAIMS:

Please replace claims 15 and 16 with the following amended claims:

--15. (Amended) The device in accordance with claim 12, characterized in that the catalytic material is used as a catalyst for soot.

16. (Amended) The device in accordance with claim 12, characterized in that the catalytic material is used as a catalyst for NO_x.--

REMARKS

Applicant respectfully requests that the foregoing amendments to Claims 15 and 16 be entered in order to avoid this application incurring a surcharge for the presence of one or more multiple dependent claims. A marked-up version of the claims showing the changes made is attached.

Respectfully submitted,

December 21, 2001

Date


Richard L. Schwaab

Registration No. 25,479

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VERSIONS WITH MARKINGS TO SHOW CHANGES MADE

15. The device in accordance with claim 12 [or 14], characterized in that the catalytic material is used as a catalyst for soot.

16. The device in accordance with claim 12 [or 14], characterized in that the catalytic material is used as a catalyst for NO_x.

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Device for the Treatment of Exhaust Gas

A catalytic converter for the exhaust flow of an
5 internal combustion engine is described in DE-C-43 03 850. The
catalytic converter consists of knit mineral fibers. The knit
material is arranged in layers in that it is either folded in
an accordion- like manner or rolled up. The flow through the
body obtained in this way takes place in a direction parallel
10 with the individual layers. The fibers from which the knit
material has been produced are coated with an appropriate
catalytic material, for example platinum.

The great advantage of this arrangement lies in a highly
effective purification of the exhaust flow while, on the other
15 hand, because of the inherently resilient knit material, there
is no danger of its destruction. Since the knit material is
furthermore produced as a tubular fabric, there are no exposed
edges where the knit material might start to unravel. Even if
yarn breaks should occur within the body formed by the knit
20 material, the structure of the knit material is still preserved
because the broken yarn is held fast by means of the mesh on
both sides of the break.

So-called monoliths are another embodiment of catalytic
converters, wherein a porous, gas-permeable ceramic body is
25 covered with the catalytic material. These ceramic bodies have
the disadvantage that they possibly might be shattered in the
exhaust gas flow.

Independently of the manner how the carrier for the
catalytic material is embodied, the known catalytic converters
30 encounter difficulties in their reaction under partial load
conditions and at a low output of the internal combustion
engine. The reason for this lies in that the exhaust gas flow
has too small a volume at these low engine outputs and is not
capable of bringing the catalytic converter up to the process
35 temperature at which the catalytic material is capable of
splitting the nitrogen monoxide. The low-volume exhaust gas
flow is cooled too extensively in the exhaust pipe.

In order to be able to start the catalytic process

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perfectly at low engine output, the catalytic converter would have to be moved closer to the outlet openings of the internal combustion engine, so that cooling in the exhaust pipe does not become too strong. But this has the result that at a high engine output the catalytic converter is destroyed thermally. The large volume exhaust gas flow is not cooled so much. With a short distance between the outlet opening of the cylinder and the catalytic converter when they are connected in a way required for partial load operations, the exhaust gas flow of a large mass would heat the catalytic converter to relatively high temperatures, which are still further increased because of the catalytic decay of the NO_x . Because of this, temperatures are reached inside the catalytic converter which will destroy it thermally, or at least damage the catalytic material.

Basically similar conditions are encountered with self-regenerating soot filters. Too large a distance of the soot filter from the outlet opening of the cylinder leads to low temperatures in the partial load range of the engine. Higher temperatures would be necessary so that the soot is burned catalytically in the filter. Too short a distance of the soot filter from the outlet opening results in too high temperatures at high engine output.

Based on the foregoing, it is the object of the invention to create a device for the exhaust gas treatment of internal combustion engines which also operates dependably in the lower output range, or partial load range, of internal combustion engines without there being the danger of it being thermally destroyed under full load operations of the engine.

In accordance with the invention, this object is attained by means of the device having the characteristics of claim 1.

Flat textile structures, which are stacked in layers, are also used for the catalytic converter material with the device in accordance with the invention. In this case the body formed in this way is composed of two different types of layers, namely layers consisting exclusively of wire and layers which are either formed of mineral fibers alone, or of a

combination of wires and mineral fibers. The layers consisting exclusively of wire are arranged in such a way that, on the inflow side, they protrude for a short distance, for example 3 to 10 mm, past the other layers.

5 In comparison with mineral fibers, wire is a very good heat conductor and it is assumed that the protruding wire layers will heat up very rapidly in the exhaust gas flow and will convey the high temperatures into the interior, or between the layers made of mineral fibers. The catalytic process is
10 started by this and further heats the catalytic converter correspondingly. It is therefore possible to arrange the novel catalytic converter at such a distance from the outlet opening of the cylinder that there is no danger of overheating the catalytic converter, even if the engine is operated under full
15 load.

Similar conditions basically exist in connection with a self-regenerating soot filter, wherein the soot deposited on the wire or the fibers with or without a catalytic coating can burn off, even if the vehicle is only operated under partial
20 load.

A housing insert, which is very resistant to mechanical damage by the exhaust gas flow is achieved if at least the first and/or second layer consists of a knit fabric. One skilled in the art understands a knit fabric to be a material
25 produced by knitting. The knit fabric is also very strong if it has been produced in the form of a tubular fabric or as a ribbon with a firm edge, because it is then possible, for one, to create a double-layered structure, and furthermore, because no exposed borders occur at the edges where there would be a
30 danger of the knit material beginning to unravel. The tubular fabric is endless in the circumferential direction, so that no wales are created which are not tied up between the neighboring wales.

The first layers are usefully connected in one piece
35 with each other, which also applies to the second layers. To achieve this, the basic materials for the first and the second layers are placed on top of each other. The double-layered

material obtained in this way is either pleated in an accordion fold or is rolled up. First and second layers then respectively alternate in the stack. Depending on the type of internal combustion engine with which the device is to be employed, the catalytic material is either a catalytic material for nitrogen monoxide, or a catalytic material for the oxidation of soot. Finally, the novel device can also be used as a self-regenerating filter arrangement for superfine particles which occur in connection with a Diesel engine as well as with a gasoline engine.

Further developments are the subject of the dependent claims. Exemplary embodiments of the subject of the invention are represented in the drawings; shown are in

Fig. 1, the device in accordance with the invention in schematic longitudinal section,

Fig. 2, the insert in accordance with Fig. 1 in a perspective schematic representation, and

Fig. 3, a further embodiment of the insert of the device in accordance with Fig. 1, also in a partial schematic representation.

Fig. 1 shows in schematic form a device 1 for treating the exhaust gas from an internal combustion engine, for example a Diesel or gasoline engine.

The device 1 has a housing 2, which is provided with an inlet connector 3 and an outlet connector 4. The inlet connector 3 is provided, for example, for a connection to the exhaust manifold of the internal combustion engine, while the exhaust pipe is connected at 4.

An insert 5 is located in the interior of the housing 2. As shown, the insert 5 completely fills the cross section of the housing 2. On the side facing the inlet connector 3, the insert 5 is secured by means of an annular collar 6, which is fastened on the housing 2. A perforated plate 7 is fastened in the housing 2 at a distance from the annular collar 6, which is used as a contact surface for the insert 5 and is intended to prevent the exhaust gas flow from displacing the insert 5 in the direction toward the outlet connector 4.

The perforated plate 7 contains a plurality of holes 8 and can also be constituted by a narrow-meshed screen, which is welded to the inside of the housing 2.

The flow through the device 1 occurs from the inlet connector 3 to the outlet connector 4 in the direction of an arrow 9. In this way, an inflow side 11 and an outflow side 12 is created on the insert 5.

The structure of the insert 5 can be seen in Fig. 2.

The insert 5 consists of two knit tubes 13 and 14, wound in a drum-like manner. The knit tube 13 consists of metal wire 15, which is knit so that a mesh is formed. This results in a structure which is endless in the circumferential direction, in which the wales 17 formed in the course of knitting extend in the direction of the generator line of the knit tube. The rows of mesh lie in the circumferential direction.

The second knit tube 14 also consists of a mesh 18, wherein the fibers from which the knit tube 14 is formed are mineral fibers. Depending on the type of use, these mineral fibers are coated with a catalytic material for soot, or with a catalytic material for NO_x . Moreover, in the case of glass fibers, the latter are also thinned out, if required.

The created tubes 13, 14 of material are laid flat, which can be seen in Fig. 2, and have been wound together over the broad side. The drum-like structure 2 represented in Fig. 2 is created in this way. The width of the knit tube 13 has been selected in respect to the width of the knit tube 14 in such a way that, when both knit tubes 13, 14 are pressed flat, the width of the knit tube 13 made of the metal wire 15 is slightly greater than the width of the knit tube 14 made of mineral fibers. Because of this, the knit tube 13 protrudes past the edge of the knit tube 14 at the one side of the insert 5.

The insert 5 is produced in the following manner:

The knit tube 13 is knit from metal wire 15 on appropriate circular knitting machines. The knit tube 14 is created from mineral fiber yarn, also on a circular knitting machine. Then the knit tube 14 made of mineral fibers is

placed on top of the knit tube made of metal wire in such a way that the knit tube 14, laid flat, is flush at the one edge with the corresponding edge of the knit tube 13 made of metal wire, also laid flat.

5 Because of the difference in width, one edge of the knit tube 13 made of metal wire protrudes past the edge of the knit tube 14, as can be schematically seen in Fig. 2. Then the double-layered structure made of the two knit tubes 13 and 14, laid flat, is wound up over the broad side, as also seen in
10 Fig. 2. Winding is continued until a lap roll of a diameter equal to the interior diameter of the housing 2 is created. Thereafter the created lap roll is cut off from the supply of knit tubes 13 and 14. The lap roll which has been created now represents the insert 5, which is arranged in the housing 2.
15 It is placed into the housing 2 in such a way that the front of the lap roll at which the knit tube 13 of metal wire protrudes faces the inlet connector 3, i.e. constitutes the inflow side 11 of the insert 5.

As can be seen from the explanation of the invention, a
20 first layer formed by the knit tube 14 respectively alternates, viewed in relation to the radial direction of the insert 5, with a second layer formed from the knit tube 13 of metal wire.

Because of the arrangement of the lap roll, or of the insert
5, the flow through the insert 5 essentially takes place in a
25 direction parallel with the approximately cylindrical (or more correctly helical) surfaces defined by the layers of the flattened knit tubes 13, 14. In relation to the main direction, namely the connection between the inlet connector 3 and the outlet connector 4, the flow takes place approximately
30 parallel with the rows of the mesh 17, wherein in this definition of the flow-through direction only the macroscopic flow is considered. In a microscopical view it can easily occur that a thread of a stream passes through a layer because of turbulence.

35 Because the knit tube 13 made of metal wire protrudes past the knit tube 14 on the inflow side 11, the structure in this area is quite a bit looser. Moreover, the metal wire has

better heat conducting properties than mineral fibers. The metal wire can absorb heat much faster on the flow-in side and convey this heat between the layers of mineral fibers, namely the layers formed by the knit tube 14. Because of this it also becomes possible in the partial load range of the engine to bring the insert 5 up to temperatures at which it can perform its catalytic functions. This occurs at a spatial distance from the outlet opening which prevents the thermal destruction of the insert 5.

The catalytic effects can possibly even be increased if, in addition the metal wire of the knit tube 13 is also coated with a catalytic material.

Instead of producing a cylindrical lap roll, such as represented in Fig. 2, there is also the option of producing a lap roll which has the shape of an oval in a view from above, so that the extension of the housing 2 matched to this is of different size in two directions placed perpendicularly on top of each other. Such a configuration has advantages, for example, when the arrangement must be placed underneath a vehicle.

With the previously explained exemplary embodiment the two knit tubes 13, 14 are wound in every case, i.e. they more or less follow a spiral.

Fig. 3 shows an embodiment wherein the two knit tubes 13, 14 are folded in an accordion-like manner into a stack. Because of the accordion-like arranged folds, respectively two layers constituted by the knit tube 14 rest directly on top of each other, which are followed, viewed in the stack direction, by two layers of a knit tube 13 placed directly on top of each other. The same effect as with the arrangement in accordance with Fig. 2 can also be achieved with such a configuration of the insert 5.

A device 1 for treating exhaust gases from internal combustion engines has a housing 2, in which an insert 5 is located, which is composed of two types of knit tubes 13, 14. One knit tube 13 consists exclusively of metal wire, while the other knit tube 14 is made completely of mineral fibers, or

primarily consists of mineral fibers. The knit tube 13 made of metal wire forms a mesh, which protrudes on the inflow side past the knit tube 14 made of mineral fibers in order to absorb additional heat and to convey it into the interior of the

5 insert 5. Because of this it is possible to arrange the insert 5 at such a distance from the outlet of the engine, that overheating in the full load range is prevented while, on the

other hand, the response of the catalytic material is also assured when employed in the partial load range of the internal

10 combustion engine.

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Claims:

1. A device (1) for the treatment of exhaust gases from internal combustion engines,

having a housing (2) with an exhaust gas inlet (3) and an exhaust gas outlet (4),

5 having at least one housing insert (5), which in accordance with the flow is arranged between the exhaust gas inlet (3) and the exhaust gas outlet (4), wherein

the housing insert (5) has an inflow side (11) facing the exhaust gas inlet (3) and an outflow side (12) facing the exhaust gas outlet (4),

10 the housing insert (5) has at least one first layer (14) of a flat textile structure extending between the inflow side (11) and the outflow side (12), and

15 the housing insert (5) has at least one second layer (13) of a flat textile structure extending between the inflow side (11) and the outflow side (12), contains a metal wire (15) and protrudes past the first layer (14) at least at the inflow side (11) in such a way that the exhaust gas flow passes through the housing insert (5) essentially parallel to the layers (13, 14).

2. The device in accordance with claim 1, characterized in that the housing insert (5) has several first layers (14) and several second layers (13) and at least one first layer (14) is located between neighboring second layers (13).

3. The device in accordance with claim 1, characterized in that the first and/or the second layer (13, 14) consist of a mesh material.

4. The device in accordance with claim 1, characterized in that the first and/or the second layer (13, 14) consist of a knit mesh tube material, laid flat, or of a knit ribbon, wherein the wales (17) lie in the longitudinal direction of the

5 'tube,' or the longitudinal direction of the ribbon.

5. The device in accordance with claim 2, characterized in that at least the preponderant portion of the first layers (14), preferably all first layers (14), are connected in one piece with each other.

6. The device in accordance with claim 2, characterized in that at least the preponderant portion of the second layers (13), preferably all second layers (13), are connected in one piece with each other.

7. The device in accordance with claim 2, characterized in that the first and second layers (13, 14) are formed by accordion- folding of base products (13, 14) constituting the respective flat textile structures.

8. The device in accordance with claim 2, characterized in that the first and second layers (13, 14) are formed by mutually rolling up the base products (13, 14) constituting the respective flat textile structure.

9. The device in accordance with claim 3, characterized in that the wales (17) extend at right angles in respect to a connecting line from the exhaust inlet (3) to the exhaust gas outlet (4).

10. The device in accordance with claim 1, characterized in that the material for the first layer (14) is exclusively mineral fibers.

11. The device in accordance with claim 1, characterized in that the material for the first layer (14) is mineral fibers and metal wire.

12. The device in accordance with claim 11, characterized in that at least the mineral fibers are coated

with a catalytic material.

13. The device in accordance with claim 1, characterized in that the material for the second layer (13) is exclusively metal wire.

14. The device in accordance with claim 13, characterized in that the metal wire is coated with a catalytic material.

15. The device in accordance with claim 12 or 14, characterized in that the catalytic material is used as a catalyst for soot.

16. The device in accordance with claim 12 or 14, characterized in that the catalytic material is used as a catalyst for NO_x.

17. The device in accordance with claim 1, characterized in that the housing insert (5) acts as a soot filter.

18. The device in accordance with claim 1, characterized in that the housing insert (5) acts as a nitrogen monoxide catalyst.

19. The device in accordance with claim 1, characterized in that housing insert (5) acts as a filter for superfine particles.

Abstract:

A device 1 for treating exhaust gases from internal combustion engines has a housing 2, in which an insert 5 is located, which is composed of two types of knit tubes 13, 14. One knit tube 13 consists exclusively of metal wire, while the other knit tube 14 is made completely of mineral fibers, or primarily consists of mineral fibers. The knit tube 13 made of metal wire forms a mesh, which protrudes on the inflow side past the knit tube 14 made of mineral fibers in order to absorb additional heat and to convey it into the interior of the insert 5. Because of this it is possible to arrange the insert 5 at such a distance from the outlet of the engine, that overheating in the full load range is prevented while, on the other hand, the response of the catalytic material is also assured when employed in the partial load range of the internal combustion engine.

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(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



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(71) Anmelder und

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(21) Internationales Aktenzeichen: PCT/DE00/02037

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D-73728 Esslingen (DE).

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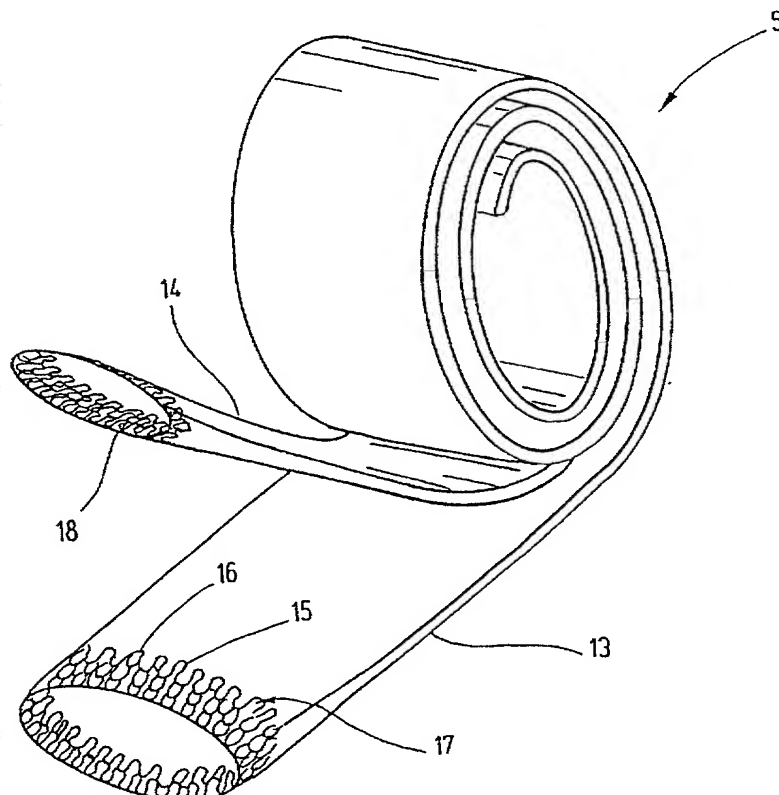
Veröffentlicht:

— Mit internationalem Recherchenbericht.

[Fortsetzung auf der nächsten Seite]

(54) Title: DEVICE FOR TREATING EXHAUST GAS

(54) Bezeichnung: EINRICHTUNG ZUR ABGASBEHANDLUNG



(57) Abstract: A device (1) for treating exhaust gas from internal combustion engines, comprising a housing (2) containing an insert (5) which is comprised of two types of knitted hoses (13,14). One knitted hose (13) exclusively consists of metal wire while the other knitted hose (14) consists of either mineral fibers alone or mainly consists of mineral fibers. The knitted hose (13) produced from metal wire forms meshes which protrude from the knitted mineral fiber hose (13) on the intake side in order to receive additional heat and conduct it towards the inside of the insert (5). It is possible to arrange the insert (5) at a sufficient distance from the exhaust of the engine, whereby overheating in the full load range can be prevented and reaction of the catalytic material on said insert can also be guaranteed in the partial load range of the internal combustion engine.

[Fortsetzung auf der nächsten Seite]

FOOTPRINT 68281001

WO 01/02705 A1

Title: DEVICE FOR TREATING
EXHAUST GAS

Inventor(s): Alfred Ernst BUCK

Appl. No.: Unassigned

10/018789

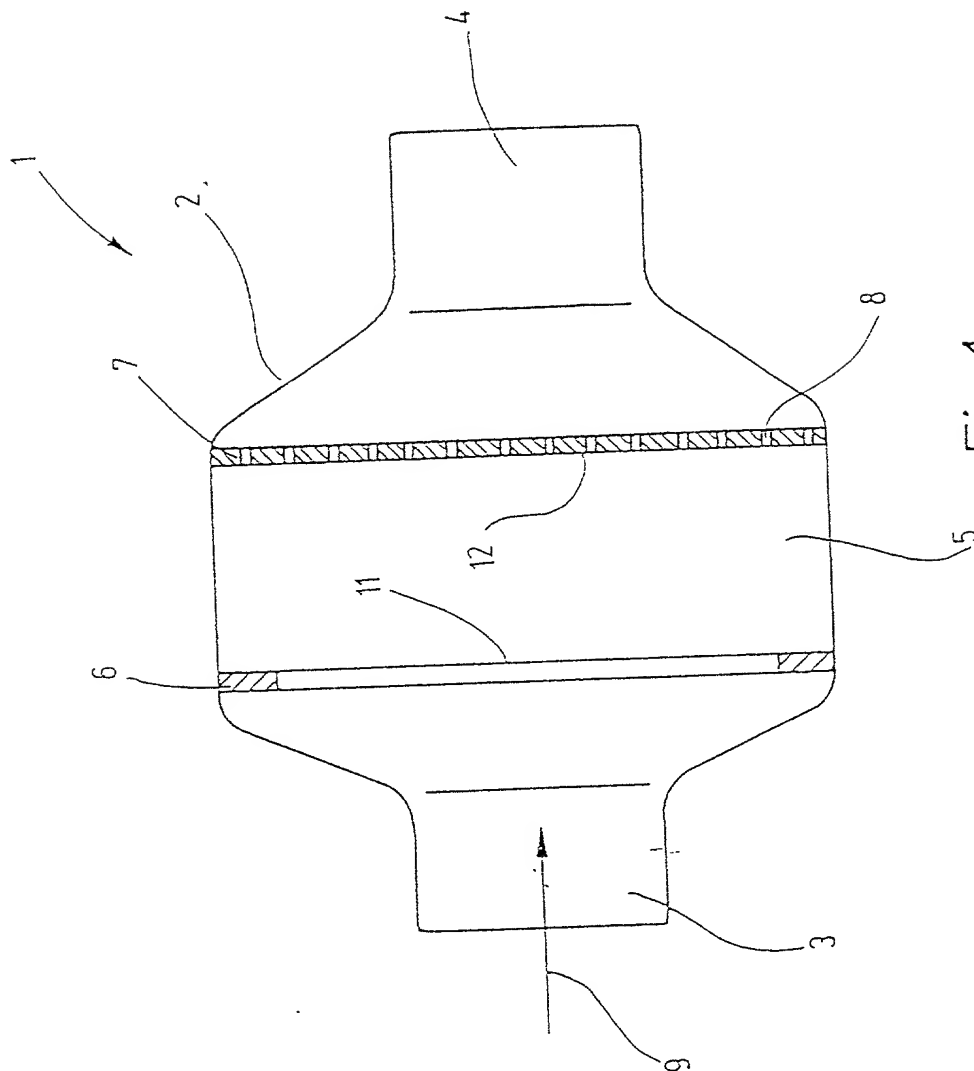


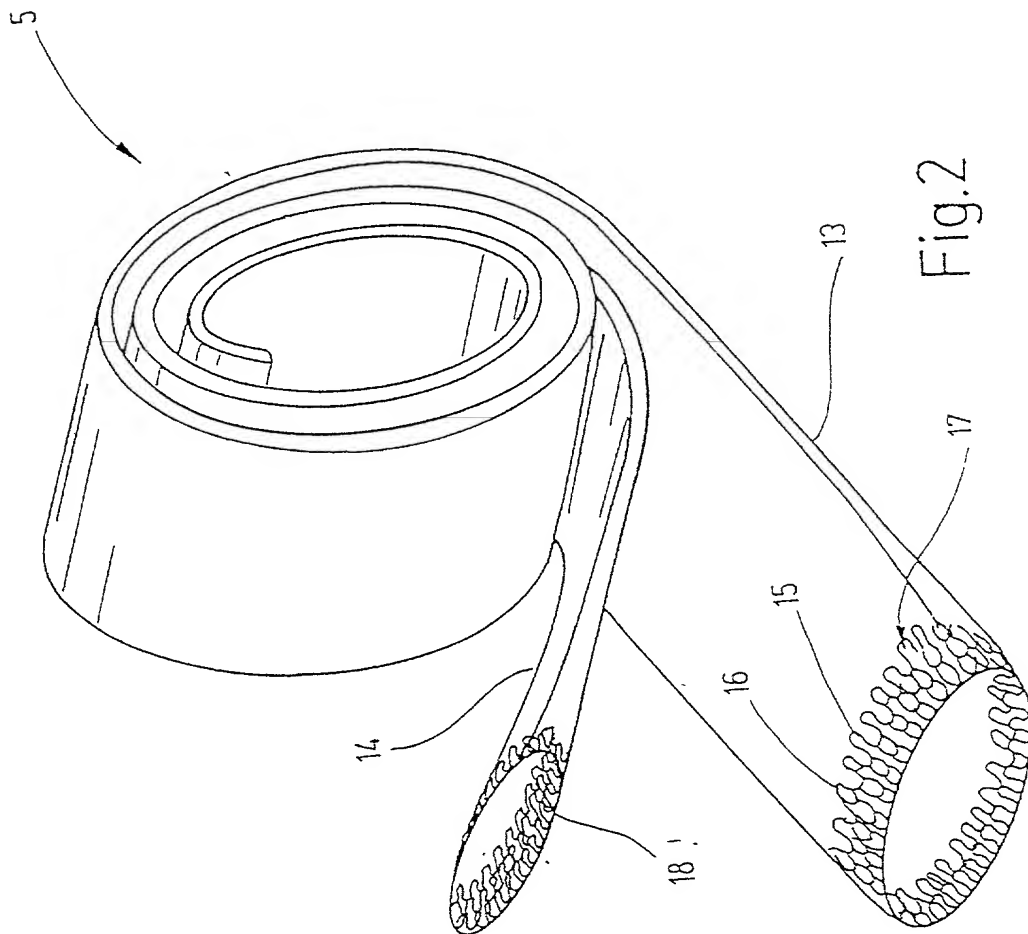
Fig. 1

Title: DEVICE FOR TREATING
EXHAUST GAS

Inventor(s): Alfred Ernst BUCK

Appl. No.: Unassigned

10/018789



Title: DEVICE FOR TREATING
EXHAUST GAS

Inventor(s): Alfred Ernst BUCK

Appl. No.: Unassigned

10/018789

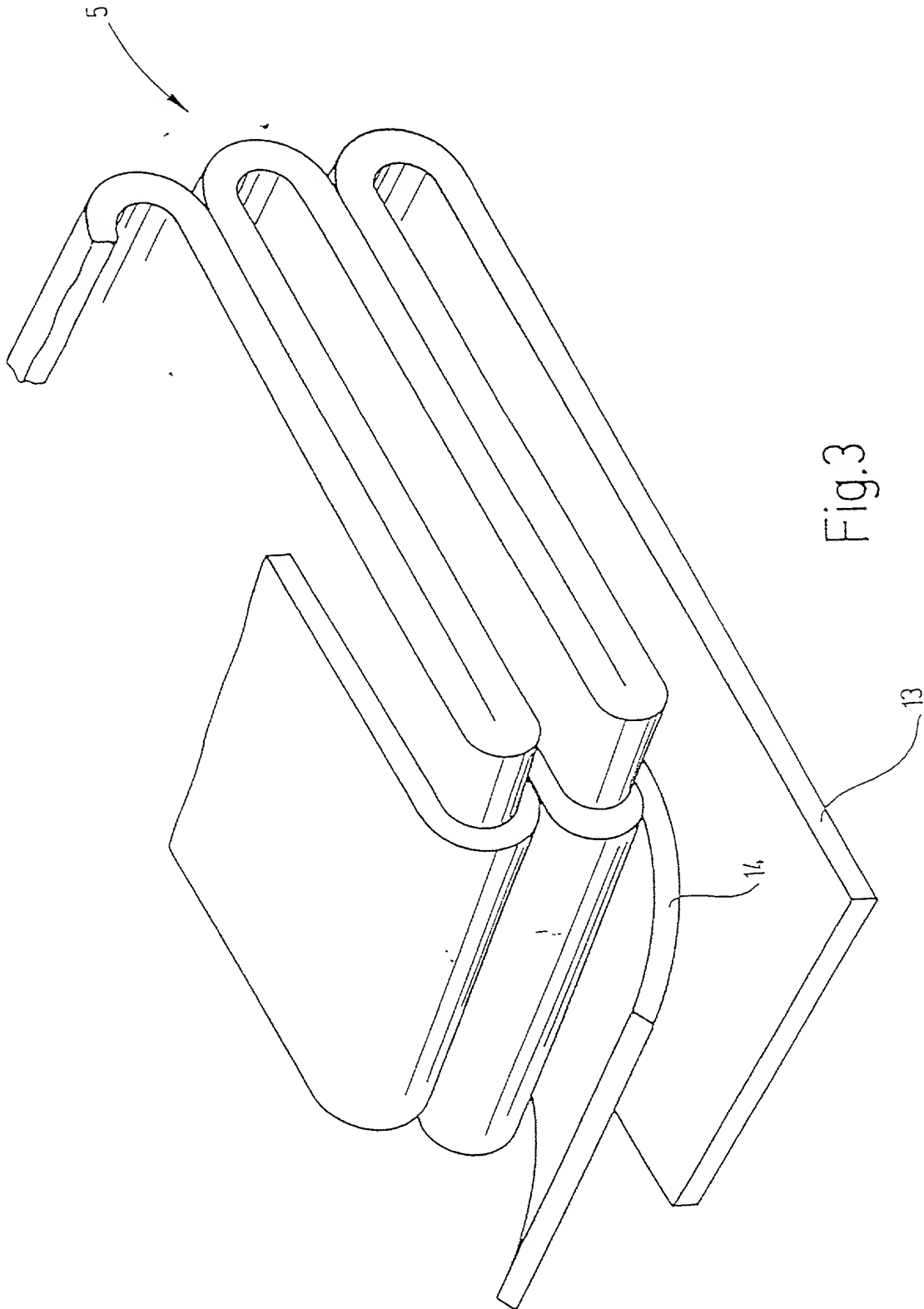


FIG. 3

Atty. Dkt. No. 077680-0116

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I HEREBY DECLARE:

THAT my residence, post office address, and citizenship are as stated below next to my name;

THAT I believe I am the original, first, and sole inventor (if only one inventor is named below) or an original, first, and joint inventor (if plural inventors are named below or in an attached Declaration) of the subject matter which is claimed and for which a patent is sought on the invention entitled

DEVICE FOR TREATING EXHAUST GAS

(Attorney Docket No. 077680-0116)

the specification of which (check one)

_____ is attached hereto.

 X was filed on June 29, 2000 as United States Application Number or PCT International Application Number PCT/DE00/02037 and was amended on _____ (if applicable).

THAT I do not know and do not believe that the same invention was ever known or used by others in the United States of America, or was patented or described in any printed publication in any country, before I (we) invented it;

THAT I do not know and do not believe that the same invention was patented or described in any printed publication in any country, or in public use or on sale in the United States of America, for more than one year prior to the filing date of this United States application;

THAT I do not know and do not believe that the same invention was first patented or made the subject of an inventor's certificate that issued in any country foreign to the United States of America before the filing date of this United States application if the foreign application was filed by me (us), or by my (our) legal representatives or assigns, more than twelve months (six months for design patents) prior to the filing date of this United States application;

THAT I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment specifically referred to above;

THAT I believe that the above-identified specification contains a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention, and sets forth the best mode contemplated by me of carrying out the invention; and

THAT I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

Atty. Dkt. No. 077680-0116

I HEREBY CLAIM foreign priority benefits under Title 35, United States Code § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number	Country	Foreign Filing Date	Priority Claimed?	Certified Copy Attached?
199 29 911.0	Federal Republic of Germany	June 29, 1999	YES	

I HEREBY CLAIM the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

U.S. Provisional Application Number	Filing Date

I HEREBY CLAIM the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application Number	PCT Parent Application Number	Parent Filing Date	Parent Patent Number

I HEREBY APPOINT the following registered attorneys and agents of the law firm of FOLEY & LARDNER:

STEPHEN A. BENT
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Reg. No. 28,163
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RICHARD L. SCHWAAB	Reg. No. <u>25,479</u>
MICHELE M. SIMKIN	Reg. No. <u>34,717</u>
HAROLD C. WEGNER	Reg. No. <u>25,258</u>

to have full power to prosecute this application and any continuations, divisions, reissues, and reexaminations thereof, to receive the patent, and to transact all business in the United States Patent and Trademark Office connected therewith.

I request that all correspondence be directed to:

Richard L. Schwaab
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Washington Harbour
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Washington, D.C. 20007-5143

Telephone: (202) 672-5414
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I UNDERSTAND AND AGREE THAT the foregoing attorneys and agents appointed by me to prosecute this application do not personally represent me or my legal interests, but instead represent the interests of the legal owner(s) of the invention described in this application.

I FURTHER DECLARE THAT all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

100
 Name of first inventor Alfred Ernst BUCK
 Residence Bondorf, Federal Republic of Germany
 Citizenship Federal Republic of Germany
 Post Office Address Eichenstrasse 14
D-71149 Bondorf, Federal Republic of Germany
 Inventor's signature Alfred Ernst
 Date 17.12.01

APPLICANT OR PATENTEE: Alfred Ernst BUCK
 SERIAL OR PATENT NO.: Unassigned
 FILED OR ISSUED:
 FOR: DEVICE FOR TREATING EXHAUST GAS

ATTORNEY DOCKET NO.: 077680/0116

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 CFR 1.27) — INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.27 for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled DEVICE FOR TREATING EXHAUST GAS, described in

- (X) the specification filed herewith
 () application serial no. X, filed X
 () patent no.: X, issued X

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey, or license any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.27(a)(1) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.27(a)(2) or a nonprofit organization under 37 CFR 1.27(a)(3).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below.

- (X) no such person, concern or organization
 () persons, concerns or organizations listed below*

* NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME: _____

ADDRESS: _____

() INDIVIDUAL () SMALL BUSINESS CONCERN () NONPROFIT CORPORATION

FULL NAME: _____

ADDRESS: _____

() INDIVIDUAL () SMALL BUSINESS CONCERN () NONPROFIT CORPORATION

FULL NAME: _____

ADDRESS: _____

() INDIVIDUAL () SMALL BUSINESS CONCERN () NONPROFIT CORPORATION

Attorney Docket No.: 077680-0116

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate: (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.


Inventor: Alfred Ernst BUCK

17.12.01
Date

Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an
 Eides Statt:

As a below named inventor, I hereby declare that:

dass mein Wohnsitz, meine Postanschrift, und meine
 Staatsangehörigkeit den im Nachstehenden nach meinem
 Namen aufgeführten Angaben entsprechen,

My residence, post office address and citizenship are as
 stated below next to my name,

dass ich, nach bestem Wissen der ursprüngliche, erste und
 alleinige Erfinder (falls nachstehend nur ein Name
 angegeben ist) oder ein ursprünglicher, erster und
 Miterfinder (falls nachstehend mehrere Namen aufgeführt
 sind) des Gegenstandes bin, für den dieser Antrag gestellt
 wird und für den ein Patent beantragt wird für die Erfindung
 mit dem Titel:

I believe I am the original, first and sole inventor (if only
 one name is listed below) or an original, first and joint
 inventor (if plural names are listed below) of the subject
 matter which is claimed and for which a patent is sought on
 the invention entitled

DEVICE FOR TREATING EXHAUST GAS

DEVICE FOR TREATING EXHAUST GAS

deren Beschreibung

the specification of which

(zutreffendes ankreuzen)

(check one)

☐ hier beigelegt ist.

☐ is attached hereto.

☒ am 29 June, 2000 unter der

☒ was filed on 29 June, 2000 as

Anmeldungsseriennummer PCT/DE00/02037

Application Serial No. PCT/DE00/02037

eingereicht wurde und am abgeändert wurde

and was amended on _____
 (if applicable).

_____ (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen
 Patentanmeldung einschliesslich der Ansprüche durchgesehen
 und verstanden habe, die eventuell durch einen Zusatzantrag
 wie oben erwähnt abgeändert wurde.

I hereby state that I have reviewed and understand the
 contents of the above identified specification, including the
 claims, as amended by any amendment referred to above.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher
 Informationen, die für die Prüfung der vorliegenden
 anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch,
 Paragraph 1.56(a) von Wichtigkeit sind, an.

I acknowledge the duty to disclose information which is
 material to the examination of this application in accordance
 with Title 37, Code of Federal Regulations, §1.56(a).

Ich beanspruche hiermit ausländische Prioritätsvorteile
 gemäss Abschnitt 35 der Zivilprozessordnung der
 Vereinigten Staaten, Paragraph 119 aller unten angegebenen
 Auslandsanmeldungen für ein Patent oder eine
 Erfindersurkunde, und habe auch alle Auslandsanmeldungen
 für ein Patent oder eine Erfindersurkunde nachstehend
 gekennzeichnet, die ein Anmeldedatum haben, das vor dem
 Anmeldedatum der Anmeldung liegt, für die Priorität
 beansprucht wird.

I hereby claim foreign priority benefits under Title 35,
 United States Code, §119 of any foreign application(s) for
 patent or inventor's certificate listed below and have also
 identified below any foreign application for patent or
 inventor's certificate having a filing date before that of the
 application on which priority is claimed:

Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: (*Name und Registrationsnummer anführen*)

Stephen A. Bent, Reg. No. 29,768; David A. Blumenthal, Reg. No. 26,257; Beth A. Burrous, Reg. No. 35,087; William T. Ellis, Reg. No. 26,874; John J. Feldhaus, Reg. No. 28,822; Michael Kaminski, Reg. No. 32,094; Kyle K. Kimms, Reg. No. 34,079; Kenneth Krosin, Reg. No. 25,735; Johnny A. Kumar, Reg. No. 34,649; Glenn Law, Reg. No. 34,371; Peter G. Mack, Reg. No. 26,001; Stephen B. Maebius, Reg. No. 35,264; Brian J. McNamara, Reg. No. 32,789; Sybil Meloy, Reg. No. 22,749; George E. Quillin, Reg. No. 32,792; Andrew E. Rawlins, Reg. No. 34,702; Bernhard D. Saxe, Reg. No. 28,665; Charles F. Schill, Reg. No. 27,590; Richard L. Schwaab, Reg. No. 25,479; Michele M. Simkin, Reg. No. 34,717; Harold C. Wegner, Reg. No. 25,258.

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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (*List name and registration number*)

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Voller Name des einzigen oder ursprünglichen Erfinders:	Full name of sole or first inventor:
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Unterschrift des Erfinders	Inventor's signature
	<i>Alfred Ernst</i>
Datum	Date
	<i>17.12.01</i>
Wohnsitz	Residence
Bondorf, Federal Republic of Germany	Bondorf, Federal Republic of Germany
Staatsangehörigkeit	Citizenship
Federal Republic of Germany	Federal Republic of Germany
Postanschrift	Post Office Address
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